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REMARKS

Pending Claims:

Claims 1-46 are currently pending in the present application. Claims 1, 26, 37, 39, 43 and 46 are amended by the present Amendment. No new matter is added by these amendments. Upon entry of the present Amendment, reconsideration of claims 1-46 is respectfully requested.

Claim Objection:

Claim 43 is objected to because of a formality. Claim 43 has been amended to correct the formality. Claim 43 now recites the method of claim 39 wherein the detecting at least the portion of the plurality of ions ejected from the volume occurs at a predetermined time after terminating the RF electrical field. Applicants submit that the amendment to claim 43 overcomes the objection.

Rejections under 35 U.S.C. §102(b) As Being Anticipated by Kelley:

Claims 1-7, 11, 13-15, 19-20, 25 and 39 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,610,397 issued to Kelley (hereinafter "Kelley"). Independent claims 1, 26, 37, and 39 are herein amended to more clearly recite the invention. No new matter is added by these amendments.

To anticipate a claim under 35 U.S.C. §102, a single reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught by the reference must be inherently present in the reference. Thus, a claim is anticipated by a reference only if each and every element of the claim is described, either expressly or inherently, in a single prior art reference.

Independent Claim 1 and Dependent Claims 2-7, 11, 13-15, 19-20 and 25

Applicants respectfully submit that Kelley does not describe each and every element of independent claim 1 as currently amended. Independent claim 1 is herein amended to recite, in

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part, that the termination of the RF electrical field ejects the plurality of ions from the ion trap for detection. This amendment is supported by the specification of the present application. For example, paragraph 39 of the originally-filed specification states, in part, that terminating the RF signal within one period of the RF field results in ejection of a relatively high ion flux because all of the ions are ejected in a relatively short period of time. In addition, paragraph 39 of the present application states, in part, that terminating the RF signal within one period of the RF field also results in a detected ion current signal that has a relatively high signal-to-noise ratio because the detected ion currents have relatively low noise since there is no electromagnetic interference caused by the ion trap power supply. Applicants submit that no new matter is added by the amendment to independent claim 1.

Applicants respectfully submit that there is no description in Kelley of an ion storage system that terminates a RF electrical field to eject a plurality of ions from an ion trap for detection as claimed in amended independent claim 1. Applicants believe that the termination of the RF electrical field described in Kelley does not eject a plurality of ions from an ion trap for detection as claimed in amended independent claim 1. Instead, as described in the following paragraphs, Applicants believe that the termination of the RF electrical field in the apparatus described in Kelley terminates a measurement cycle. Furthermore, Applicants believe that if any ions are ejected as a result of the termination of the RF electrical field in the apparatus described in Kelley, that these ions are not intentionally detected because they are not ions of interest.

Paragraph 5 of the Office Action dated July 17, 2003 states that Kelly discloses in column 5, lines 1-4 and in column 4, lines 40-45, the switching off (or termination) of the RF electrical field wherein the termination of the RF electric field ejects a plurality of ions from the ion trap. Applicants believe that the text in column 5, lines 1-4 of Kelley refers to the time period immediately following period B in the diagram illustrated in FIG. 2 of Kelley where all voltage signal sources are switched off. The diagram illustrated in FIG. 2 of Kelley indicates that there is no ion signal present during this period. The time period immediately following period B in the diagram illustrated in FIG. 2 of Kelley appears to be a time period after the completion of the ion signal measurements and before the start of period C, where the method is repeated.

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Furthermore, Applicants believe that the text in column 4, lines 40-45 of Kelley refers to time period B, which is before the termination of the RF electric field. The sentence preceding this text (column 4, line 38-40 of Kelley) states that the frequency of the second supplemental AC signal is changed to induce dissociation of the different parent ions during period B. Applicants believe that each daughter ion produced during the associated frequency scan that has a resonance frequency that matches the frequency of the first supplemental signal will be resonated out of the trap for detection during period B. Therefore, Applicants submit that all ions of interest in the apparatus described in Kelley have been measured prior to the termination of period B.

Thus, Applicants submit that Kelley does not describe an ion storage system that terminates a RF electrical field to eject the plurality of ions from an ion trap for detection. Instead, Applicants believe that Kelley describes an apparatus that terminates a RF electrical field to end a detection cycle. If any ions are ejected after the switching off (or termination) of the RF electrical field in the apparatus described in Kelley, these ions are not intentionally detected. In paragraph 35 of the present application, Applicants state that known ion storage systems typically extract ions while continuing to apply the RF field to an ion trap. The apparatus described in Kelley is an example of such a known ion storage system.

Independent Claim 39

Applicants respectfully submit that Kelley does not describe each and every element of independent claim 39 as currently amended. Independent claim 39 is herein amended to recite, in part, that the method for detecting ions includes terminating the RF electrical field, thereby ejecting the plurality of ions from the volume for detection. Applicants submit that no new matter is added by this amendment.

Applicants respectfully submit that there is no description in Kelley of a method for detecting ions that includes terminating the RF electrical field to eject the plurality of ions from the volume for detection. As described above, Applicants submit that Kelley does not describe a method for detecting ions that terminates a RF electrical field to eject the plurality of ions from an ion trap for detection. Instead, Applicants believe that Kelley describes a method including

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terminating a RF electrical field to end a detection cycle.

In view of the above remarks, Applicants respectfully submit that Kelley does not describe each and every element of independent claims 1 and 39 as currently amended, either expressly or inherently. Therefore, Applicants submit that Kelley does not anticipate amended independent claims 1 and 39 and dependent claims 2-7, 11, 13-15, 19-20 and 25 under 35 U.S.C. §102(b).

Rejections under 35 U.S.C. §102(b) As Being Anticipated by Mordehai:

Claims 1-3, 8-14, 16-17, 22-31, 33, 35, 37-40 and 43-46 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,650,617 issued to Mordehai (hereinafter "Mordchai"). Independent claims 1, 26, 37, 39 and 46 are herein amended to more clearly recite the invention. No new matter is added by these amendments.

To anticipate a claim under 35 U.S.C. §102, a single reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught by the reference must be inherently present in the reference. Thus, a claim is anticipated by a reference only if each and every element of the claim is described, either expressly or inherently, in a single prior art reference.

Independent Claims 1 and 26 and Dependent Claims 2-3, 8-14, 16-17, 22-25, 27-31, 33, and 35

Applicants respectfully submit that Mordehai does not describe each and every element of independent claims 1 and 26 as currently amended. As described above, amended independent claims 1 and 26 recite a switching device that terminates the RF electrical field where the termination of the RF electrical field ejects the plurality of ions from the ion trap for detection. Applicants respectfully submit that there is no description in Mordehai of an ion storage system that terminates a RF electrical field to eject a plurality of ions from an ion trap for detection as claimed in amended independent claims 1 and 26. Instead, Applicants believe that Mordehai describes an apparatus that terminates a retarding electric field during ion analysis by switching a DC voltage.

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Paragraph 18 of the Office Action dated July 17, 2003 states that Mordehai discloses in column 7, lines 2-5 a switching device for terminating the RF electrical field for ejecting ions from an ion trap and ion detection that is synchronized with the switching off of the RF electrical field. Applicants believe that Column 7, lines 2-5 of Mordehai describes the following three events that occur during the ion analyzing stage of the apparatus described in Mordehai: (1) the retarding field is terminated by switching the DC voltage of the electrode to the DC end cap electrode voltage; (2) the buffer gas is pumped out; and (3) the signal is acquired. Applicants, therefore, believe that the switching device referred to in paragraph 18 of the Office Action dated July 17, 2003 is a switching device that terminates a DC electric field, not a RF electric field as stated in Paragraph 18 of the Office Action dated July 17, 2003.

Furthermore, Applicants believe that Mordehai actually teaches away from a switching device for terminating a RF electrical field where the termination of the RF electric field ejects ions from the ion trap for detection as claimed in amended independent claims 1 and 26. Mordehai appears to describe an apparatus that applies a RF voltage during ion extraction. See, for example, Mordehai column 3, lines 19-21 and Mordehai column 6, lines 31-34. Also see FIG. 6 of Mordehai which illustrates a RF voltage being applied during ion detection. Therefore, Applicants respectfully submit that Mordehai does not describe a switching device for terminating the RF electrical field for ejecting ions from an ion trap and, in fact, teaches away from such a device.

In view of the above remarks, Applicants respectfully submit that Mordehai does not describe each and every element of amended independent claims 1 and 26, either expressly or inherently. Therefore, Applicants submit that Mordehai does not anticipate amended independent claims 1 and 26 and dependent claims 2-3, 8-14, 16-17, 22-25, 27-31, 33, and 35 under 35 U.S.C. §102(b).

Independent Claims 37, 39 and 46 and Dependent Claims 38, 40, and 43-45

Applicants respectfully submit that Mordehai does not describe each and every element of amended independent claims 37, 39 and 46. Amended independent claim 37

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recites an ion storage system that includes a means for terminating the RF electrical field where the termination ejects the plurality of ions from the volume for detection. Amended independent claim 39 recites a method of detecting ions that includes terminating the RF electrical field to eject the plurality of ions from the volume for detection. Amended independent claim 46 recites a leak detector that includes a switching device that terminates the RF electrical field where the termination of the RF electrical field ejects the plurality of ions from the ion trap for detection.

As described above, Applicants believe that the switching device described in Mordehai and referred to in the Office Action dated July 17, 2003, is a switching device that terminates a DC field, not a RF field. In addition, Applicants believe that Mordehai actually teaches away from a switching device that terminates a RF electrical field that ejects ions from the ion trap for detection, as claimed in amended independent claims 37, 39 and 46.

In view of the above remarks, Applicants respectfully submit that Mordehai does not describe each and every element of independent claims 37, 39 and 46 as currently amended, either expressly or inherently. Therefore, Applicants submit that Mordehai does not anticipate amended independent claims 37, 39 and 46 and dependent claims 38, 40, and 43-45 under 35 U.S.C. §102(b).

Rejections under 35 U.S.C. §103:

Claims 8-10, 18, 20, 22-24, 26-29, 31-32, 34-35, 37-38, 40-44 and 46 are rejected under 35 U.S.C. §103(a) as being obvious over Kelley and U.S. Patent No. 6,140,641, issue to Yoshinari et al. (hereafter "Yoshinari"). Paragraph 27 of the Office Action dated July 17, 2003 states that Kelley discloses the claimed invention but does not explicitly teach the following three recited limitations: (1) neutral gas interaction; (2) clock; and (3) predetermined time. In view of the above amendments and remarks, Applications respectfully submit that Kelley does not disclose the claimed invention. Therefore, Applications respectfully submit that Claims 8-10, 18, 20, 22-24, 26-29, 31-32, 34-35, 37-38, 40-44 and 46 are not obvious over Kelley and Yoshinari.

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Paragraph 32 of the Office Action dated July 17, 2003 states that dependent claims 21 and 36 are rejected under 35 U.S.C. §103(a) as being unpatentable over Mordehai. In view of the above amendments and remarks, Applications respectfully submit that Mordehai actually teaches away from the inventions claimed in independent claims 1 and 26. Therefore, Applications respectfully submit that dependent claims 21 and 36 are not obvious over Kelley and Yoshinari.

CONCLUSION

Claims 1-46 are currently pending in the present application. Claims 1, 26, 37, 39, 43 and 46 have been amended. In view of the foregoing, reconsideration and allowance of all pending claims (i.e., claims 1-46) is respectfully requested.

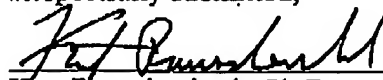
The Commissioner is hereby authorized to charge any proper fees to Attorney's Deposit Account No. 501211.

If, in the Examiner's opinion, a telephonic interview would expedite prosecution of the present application, the undersigned attorney would welcome the opportunity to discuss any outstanding issues, and to work with the Examiner toward placing the application in condition for allowance.

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Respectfully submitted,



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